No. of Printed Pages : 5

**BCE-031**

# DIPLOMA IN CIVIL ENGINEERING
## DCLE(G)
## Term-End Examination
## December, 2016

00373

## BCE-031 : ADVANCED SURVEY

*Time : 2 hours* *Maximum Marks : 70*

***Note :*** *Question no. 1 is **compulsory**. Attempt any **four** questions from the rest of the questions. Use of scientific calculator is allowed.*

1. Select the most appropriate answer for each of the following multiple choice questions : *7×2=14*

   (a) The instrument which can perform all survey operations in a single run is

   (i) EDM

   (ii) GPS

   (iii) Total station

   (iv) Auto level

   (b) A curve of varying radius introduced between a straight and a circular curve is

   (i) Compound curve

   (ii) Deviation curve

   (iii) Transition curve

   (iv) Straight circle curve

(c) In Tacheometry, there are the following numbers of stadia wires :

(i) 2

(ii) 4

(iii) Cross wire × 2

(iv) None of the above

(d) The survey in which curvature of the Earth is taken into consideration is

(i) Geographical Survey

(ii) Plane Survey

(iii) Geological Survey

(iv) Geodetic Survey

(e) The length of long chord is given by the expression

(i) $L = 2R \cos \frac{\phi}{2}$

(ii) $L = 2R \tan \frac{\phi}{2}$

(iii) $L = 2R \sin \frac{\phi}{2}$

(iv) $L = 2R \operatorname{cosec} \frac{\phi}{2}$

(f) WGS-84 is related to the

(i) Global Positioning System

(ii) Total Station Survey

(iii) Electronic levels

(iv) Tacheometry

(g) The last reading taken from an electronic theodolite station is

(i) Back sight

(ii) Last sight

(iii) Fore sight

(iv) None of the above

2. (a) Draw a neat sketch of a circular curve and show its various elements.

(b) What are the methods of designation of a curve ? Derive a relationship between the degree of a curve and its radius. *2×7=14*

3. (a) Differentiate between fixed hair method and movable hair method. Discuss the advantages and disadvantages of each method.

(b) Discuss the subtense bar method of tacheometric surveying. What are its advantages ? *2×7=14*

4. A transition curve is required to be introduced between a straight and a circular curve of 300 m radius. The gauge of the railway track is 1·5 m and the maximum superelevation allowed is 10 cm. The transition curve is to be designed for a velocity so that no lateral pressure is imposed on the rails. The rate of change of radial acceleration is 0·3 m/sec$^2$/sec. Determine the required length of the transition curve and design speed. *14*

5. (a) What is project survey ? Describe the various steps involved in project survey.

   (b) What are the signals used in Trilateration survey ? Explain with neat sketches. *2×7=14*

6. Explain any ***four*** of the following : $4 \times 3\frac{1}{2} = 14$

   (a) Gyro-theodolite

   (b) Temporary adjustments of theodolite

   (c) Collimation Test

   (d) GPS and GIS

   (e) Total Station

   (f) Superelevation

   (g) Sounding Method

7. Write short notes on any ***four*** of the following : $4 \times 3\frac{1}{2} = 14$

(a) Traversing

(b) Static and Kinematic Positioning

(c) Three Segments of GPS

(d) Automatic Levels

(e) Reflectors

(f) Reciprocal Observations

(g) Anallactic Lens